

Calculate your age on other planets from Scienceworks, Melbourne

Background information

This activity uses the idea of birthdays to describe the length of each planet's orbit. The following definitions are used:

Day: the time taken for the Earth to rotate once about its axis.

Year: the time taken for the Earth to revolve once around the Sun.

Because both of these definitions particularly refer to the Earth, it is more appropriate to call these passages of time an 'Earth day' and an 'Earth year'. A 'Mars day' is then the time taken by Mars to rotate once about its axis and a 'Mars year' is the time taken for Mars to orbit the Sun and so on, for all the planets.

Our age on Earth is based on 'Earth years'. It is the number of times the Earth has orbited the Sun since the day we were born. If we were to live on another planet in the Solar System our age would be different because each planet takes a different amount of time to orbit the Sun. In other words each planet has a different year length.

Pluto has been included for historical reasons despite its planetary declassification.

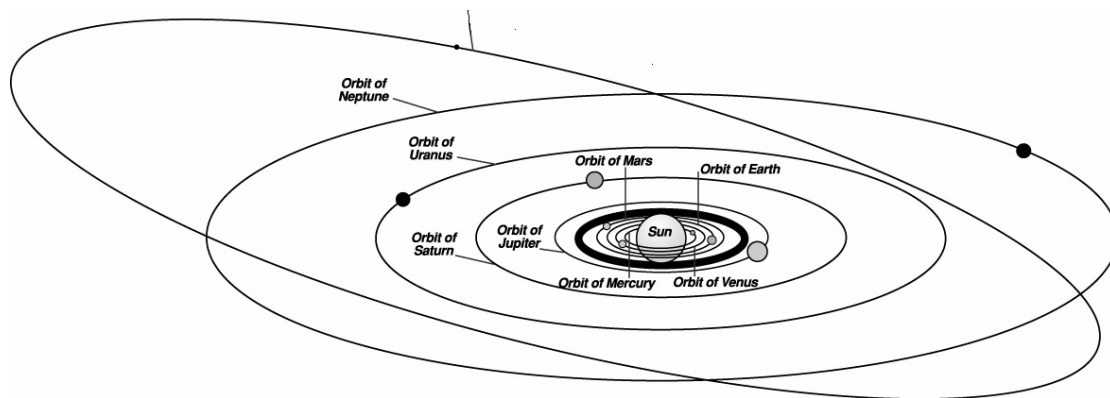
There are actually two definitions of 'day': Sidereal day is the time of rotation of the Earth relative to the stars. Solar day is the time of rotation of the Earth relative to the Sun. Our daily time keeping is based on the 'mean solar day', which is defined to be 24 hours. On Earth the solar day and sidereal day are almost the same, with the solar day being three minutes 54 seconds longer than the sidereal day. (That's why the stars rise almost four minutes earlier each night).

Because Mercury rotates three times for every two orbits of the Sun (i.e. has three sidereal days every two years) a solar day on

Mercury is equal to two Mercury years or 176 Earth days. While on Venus, a year (224.70 Earth days) is shorter than the sidereal day (243.0 Earth days) which means that the solar day for Venus is 116.67 Earth days. Venus also rotates in the opposite direction to Earth, so on Venus the sun would rise in the West and set in the East.

Orbit of Pluto (dwarf planet)

Student activity



<http://museumvictoria.com.au/scienceworks/education/> 1

Calculate your age on other planets: Worksheet

Introduction

Use the table below and a calculator to determine your age on a particular planet. If you are exactly 12 years old, that's 4 380 days (12×365). It would also mean that today is your birthday. If, however, you lived on Mercury and had a birthday every 88 days then you would be nearly 50 years old ($4\,380 \div 88 = 49.77$).

What you need

- Calculator

What to do

- Calculate your exact age in days:

My age in years, months and days Years = Months =

My age in days Multiply by 365 = Multiply by 30 =

Days =

Multiply by 1 =

Add together =

To simplify the calculations we have assumed here that every month has 30 days. Add all three numbers together to find out how many days old you are today.

I am _____ days old (D) today
_____/_____/_____(date)

Planet

Mercury Venus Earth Mars Jupiter Saturn Uranus Neptune Pluto
(dwarf planet)

Time to orbit Sun

88.0 days 225.0 days 365.25 days 687.0 days 11.8 years 29.4
years 84.0 years 164.0 years 248 years

On this planet I am this many years old:

$D/88 = D/225 = D/365 = D/687 = D/(11.8 \times 365) = D/(29.4 \times 365)$
 $= D/84 \times 365 = D/164 \times 365 = D/248 \times 365 =$

Reference:

<http://museumvictoria.com.au/scienceworks/education/>

Other websites to calculate your age

<http://www.exploratorium.edu/ronh/age/>

<http://www.enchantedlearning.com/subjects/astronomy/age.shtml>